

WHAT IS CLAIMED IS:

1. An isolated nucleic acid molecule, said molecule encoding a nematode-responsive protein wherein said nucleic acid molecule comprises a nucleotide sequence selected from the group consisting of:

- (a) a nucleotide sequence comprising the sequence set forth in SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, or 20;
- (b) a nucleotide sequence comprising an effective number of contiguous nucleotides of the sequence of SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, or 20 so that said nucleotide sequence encodes a protein that retains nematode-responsive activity;
- (c) a nucleotide sequence having at least 90% sequence identity to the sequence of SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, or 20, wherein said nucleotide sequence encodes a protein with nematode-responsive activity;
- (d) a nucleotide sequence which hybridizes under conditions of high stringency to SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, or 20, wherein said nucleotide sequence encodes a protein with nematode-responsive activity;
- (e) a nucleic acid molecule comprising a sequence encoding the amino acid sequence set forth in SEQ ID NOs: 2, 4, 7, 9, 11, 13, 15, 17, 19 or 21;  
and
- (f) a nucleic acid molecule comprising a sequence deposited as ATCC Deposit No. PTA-4153.

2. The isolated nucleic acid molecule of claim 1, wherein said isolated nucleic acid molecule encodes a polypeptide having CDPK, NRTF1, NRP, 7OM or IPP activity.

3. An expression cassette comprising the nucleic acid molecule of claim 1.

4. The expression cassette of claim 3, wherein said nucleic acid molecule is operably linked to a promoter that drives expression in a host cell.

5. A plant cell having stably incorporated in its genome the nucleic acid molecule of claim 1.
6. A plant cell having stably incorporated into its genome at least one expression cassette of claim 3.
7. The plant cell of claim 6, wherein said plant cell is from a dicot plant.
8. The plant cell of claim 7, wherein said dicot plant is soybean.
9. The plant cell of claim 6, wherein said plant cell is a root cell.
10. A nucleic acid molecule that drives expression of an operably linked nucleic acid sequence in a plant cell, wherein said nucleic acid molecule comprises a nucleotide sequence selected from the group consisting of:
  - (a) a nucleotide sequence comprising the sequence set forth in SEQ ID NOs: 5 or 22;
  - (b) a nucleotide sequence comprising an effective number of contiguous nucleotides of the sequence of SEQ ID NOs: 5 or 22, wherein said nucleotide sequence regulates expression of an operably linked nucleic acid sequence in a nematode-responsive manner;
  - (c) a nucleotide sequence having at least 90% sequence identity to the sequence of SEQ ID NOs: 5 or 22, wherein said nucleotide sequence regulates expression of an operably linked nucleic acid sequence in a nematode-responsive manner; and
  - (d) a nucleotide sequence which hybridizes under conditions of high stringency to SEQ ID NOs: 5 or 22, wherein said nucleotide sequence regulates expression of an operably linked nucleic acid sequence in a nematode-responsive manner.
11. An expression cassette comprising the nucleic acid molecule of claim 10.

12. A plant cell having stably incorporated in its genome the nucleic acid molecule of claim 10.
13. The plant cell of claim 12, wherein the plant cell is from a dicot plant.
14. The plant cell of claim 13, wherein the dicot plant is soybean.
15. The plant cell of claim 12, wherein said cell is a root cell.
16. A method for inducing transcription in a plant cell, of an operably linked heterologous nucleic acid sequence, said method comprising transforming a plant cell with a nucleic acid molecule operably linked to a promoter that regulates transcription of said sequence in a plant cell in response to a nematode stimulus; wherein said promoter comprises a nucleotide sequence selected from the group consisting of:
  - (a) a nucleotide sequence comprising the sequence set forth in SEQ ID NOs: 5 or 22;
  - (b) a nucleotide sequence comprising an effective number of contiguous nucleotides of the sequence of SEQ ID NOs: 5 or 22, wherein said nucleotide sequence has nematode-regulated promoter activity;
  - (c) a nucleotide sequence having at least 90% sequence identity to the sequence of SEQ ID NOs: 5 or 22, wherein said nucleotide sequence has nematode-regulated promoter activity; and
  - (d) a nucleotide sequence which hybridizes under conditions of high stringency to SEQ ID NOs: 5 or 22, wherein said nucleotide sequence has nematode-regulated promoter activity.
17. A method of modulating the expression of a nucleotide sequence of interest in a plant, said method comprising:
  - (a) transforming a plant cell with a nucleic acid molecule comprising said nucleotide sequence of interest operably linked to a promoter which induces transcription of said sequence in a plant cell in response to a

nematode stimulus, wherein said promoter is selected from the group consisting of:

- (i) a nucleotide sequence comprising the sequence set forth in SEQ ID NOs: 5 or 22;
  - (ii) a nucleotide sequence comprising an effective number of contiguous nucleotides of the sequence of SEQ ID NOs: 5 or 22, wherein said nucleotide sequence has nematode-regulated promoter activity;
  - (iii) a nucleotide sequence having at least 90% sequence identity to the sequence of SEQ ID NOs: 5 or 22, wherein said nucleotide sequence has nematode-regulated promoter activity; and
  - (iv) a nucleotide sequence which hybridizes under conditions of high stringency to SEQ ID NOs: 5 or 22, wherein said nucleotide sequence has nematode-regulated promoter activity.
- (b) regenerating a stably transformed plant from said plant cell; and
  - (c) exposing said plant to said nematode stimulus.

18. The method of claim 17, wherein said plant is a dicot.

19. The method of claim 18, wherein said dicot is soybean.

20. The method of claim 17, wherein expression is altered in the root tissues of said plant, wherein said root tissues are selected from the group consisting of pericycle and vascular cylinder.

21. A plant stably transformed with a nucleic acid molecule comprising a heterologous nematode-responsive sequence operably linked to a promoter that induces transcription of said nematode-responsive sequence in a plant cell in response to a nematode stimulus, wherein said promoter comprises a nucleotide sequence selected from the group consisting of:

- (a) a nucleotide sequence comprising the sequence set forth in SEQ ID NOs: 5 or 22;
  - (b) a nucleotide sequence comprising an effective number of contiguous nucleotides of the sequence of SEQ ID NOs: 5 or 22, wherein said nucleotide sequence has nematode-regulated promoter activity;
  - (c) a nucleotide sequence having at least 90% sequence identity to the sequence of SEQ ID NOs: 5 or 22, wherein said nucleotide sequence has nematode-regulated promoter activity; and
  - (d) a nucleotide sequence which hybridizes under conditions of high stringency to SEQ ID NOs: 5 or 22, wherein said nucleotide sequence has nematode-regulated promoter activity.
22. The plant of claim 21, wherein said plant is a dicot.
23. The plant of claim 21, wherein said dicot is soybean.
24. Transformed seed of any of the plants of claims 21-23, wherein the seed comprise the nucleotide sequence.
25. A method for conferring or improving nematode resistance in a plant, said method comprising:
- (a) transforming said plant with a nucleic acid molecule comprising a heterologous sequence operably linked to a regulatory sequence that induces transcription of said heterologous sequence in a plant cell in response to a nematode stimulus; and
  - (b) regenerating stably transformed plants, wherein said heterologous sequence comprises a nucleotide sequence selected from the group consisting of:
    - (i) a nucleotide sequence comprising the sequence set forth in SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, 20 or 33;
    - (ii) a nucleotide sequence comprising an effective number of contiguous nucleotides of the sequence of SEQ ID NOs: 1, 3, 6,

- 8, 10, 12, 14, 16, 18, 20 or 33, wherein said nucleotide sequence encodes a protein with nematode-responsive activity;
- (iii) a nucleotide sequence having at least 90% sequence identity to the sequence of SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, 20 or 33, wherein said nucleotide sequence encodes a protein with nematode-responsive activity; and
- (iv) a nucleotide sequence which hybridizes under conditions of high stringency to SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, 20 or 33, wherein said nucleotide sequence encodes a protein with nematode-responsive activity; and
- (c) exposing said plant to said nematode stimulus.

26. A plant stably transformed with a nucleic acid molecule comprising a heterologous sequence operably linked to a regulatory sequence that induces transcription of said heterologous sequence in a plant cell in response to a nematode stimulus, wherein said heterologous sequence comprises a nucleotide sequence selected from the group consisting of:

- (a) a nucleotide sequence comprising the sequence set forth in SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, 20 or 33;
- (b) a nucleotide sequence comprising an effective number of contiguous nucleotides of the sequence of SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, 20 or 33, wherein said nucleotide sequence encodes a protein with nematode-responsive activity;
- (c) a nucleotide sequence having at least 90% sequence identity to the sequence of SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, 20 or 33, wherein said nucleotide sequence encodes a protein with nematode-responsive activity; and
- (d) a nucleotide sequence which hybridizes under conditions of high stringency to SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, 20 or 33, wherein said nucleotide sequence encodes a protein with nematode-responsive activity.

27. The plant of claim 26, wherein said promoter is selected from the group consisting of a constitutive promoter, a tissue-preferred promoter, and an inducible promoter.
28. The plant of claim 26, wherein said plant is a monocot.
29. The plant of claim 26, wherein said monocot is selected from the group consisting of maize, wheat, rice, barley, sorghum, and rye.
30. The plant of claim 26, wherein said plant is a dicot.
31. The dicot plant of claim 30, wherein said dicot plant is soybean.
32. Transformed seed of the plant of any of claims 26-31, wherein the seed comprise the heterologous nucleotide sequence. .
33. An isolated polypeptide having nematode-regulated activity, wherein said polypeptide is selected from the group consisting of:
- (a) a polypeptide comprising the amino acid sequence set forth in SEQ ID NOs: 2, 4, 7, 9, 11, 13, 15, 17, 19, or 21;
  - (b) a polypeptide encoded by a nucleotide sequence comprising the sequence set forth in SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, or 20;
  - (c) a polypeptide comprising an amino acid sequence encoded by a nucleotide sequence deposited as Deposit No. PTA-4153;
  - (d) a polypeptide encoded by a nucleotide sequence that has at least 90% sequence identity to the sequence set forth in SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, or 20;
  - (e) a polypeptide comprising an amino acid sequence having at least 90% sequence identity to the sequence set forth in SEQ ID NOs: 2, 4, 7, 9, 11, 13, 15, 17, 19, or 20; and

- (f) a polypeptide comprising an effective number of contiguous amino acids of any of (a) through (e), wherein said polypeptide retains nematode-regulated activity.

34. A method for conferring or improving nematode resistance in a plant, said method comprising:

- (a) transforming said plant with a nucleic acid construct designed to inhibit or suppress expression of a native sequence; and
- (b) regenerating stably transformed plants, wherein said native sequence comprises a nucleotide sequence selected from the group consisting of:
  - (i) a nucleotide sequence comprising the sequence set forth in SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, 20, or 33;
  - (ii) a nucleotide sequence comprising an effective number of contiguous nucleotides of the sequence of SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, 20, or 33, wherein said nucleotide sequence encodes a protein with nematode-responsive activity; and
  - (iii) a nucleotide sequence having at least 90% sequence identity to the sequence of SEQ ID NOs: 1, 3, 6, 8, 10, 12, 14, 16, 18, 20, or 33, wherein said nucleotide sequence encodes a protein with nematode-responsive activity.